Local ecological culture and the quest for a meaningful life

🆔 **Leonard Ssozi**

Institute for Science in Society, Radboud University, Netherlands.
Email: leonard.ssozi@gmail.com

ABSTRACT

This study investigates the influence of Local Ecological Culture (LEC) on the pursuit of a meaningful life among communities residing adjacent to Mabira Forest in Uganda. Employing a mixed-method approach, the research explores the interplay between these communities and their environment, focusing on whether forest conservation practices are driven by immediate utilitarian benefits (shallow happiness) or by deeper ecological values (deep happiness). The study introduces key concepts such as "deep happiness" and Ubuntu to analyze how these communities conceptualize a meaningful life in relation to their ecological context. A principal components analysis (PCA) of the field data reveals three core dimensions of LEC: functional relationships with nature, environmental stewardship, and the notion of an embedded life. The findings indicate that both men and women, across various age groups, uphold strong commitments to ecological sustainability and community well-being, although distinct patterns of engagement emerge according to gender and age. This research highlights the pivotal role of local cultural practices in supporting environmental conservation and emphasizes the potential for community-based approaches to sustainability. By integrating LEC with broader conservation frameworks and sustainable livelihood strategies, the study contributes to a deeper understanding of how cultural values can inform environmental management in forest-dependent communities. The results offer critical insights for developing conservation policies that incorporate local ecological knowledge, promoting both environmental resilience and socio-economic sustainability.

Contribution/Originality: This study introduces the concepts of "deep happiness" and Ubuntu into the context of Local Ecological Culture (LEC) in forest-adjacent communities, providing an original framework for understanding how these cultural values shape environmental conservation. It is the first to explore how LEC informs the pursuit of a meaningful life by distinguishing between shallow and deep ecological engagement, a perspective largely unexamined in African contexts.

1. INTRODUCTION

This study serves as a foundation for a strength-based approach by examining the concept of Local Ecological Culture (LEC), which encompasses the ideas people hold regarding their relationship with the environment. For example, do they believe that soils and forests should be preserved for future generations? Is a meaningful life intrinsically connected to nature? Given that such questions have rarely been explored within African contexts, the study begins by elaborating on key "sensitizing concepts" such as deep happiness and Ubuntu, which provide a platform for developing a robust and balanced research tool.

The study first conceptualizes the notions of shallow and deep happiness and examines their role in shaping the quest for a meaningful life. In this context, I draw upon theories of meaning to further explore the concept of a meaningful life. Additionally, I elucidate the concept of Local Ecological Culture, its relation to the pursuit of a meaningful life, and the values, meanings, and practices associated with it.

Building on this conceptual framework, the study utilizes field data collected from the Mabira Forest area in Najjembe to investigate local perceptions of a meaningful life. It seeks to determine whether forest-adjacent communities protect the forest for the material benefits it provides (shallow happiness), as an expression of gratitude to nature (deep happiness), or whether their conservation efforts are motivated by Local Ecological Culture. Furthermore, the study explores what constitutes a meaningful life for these communities and assesses whether Local Ecological Culture varies across different demographic groups, including age and sex.

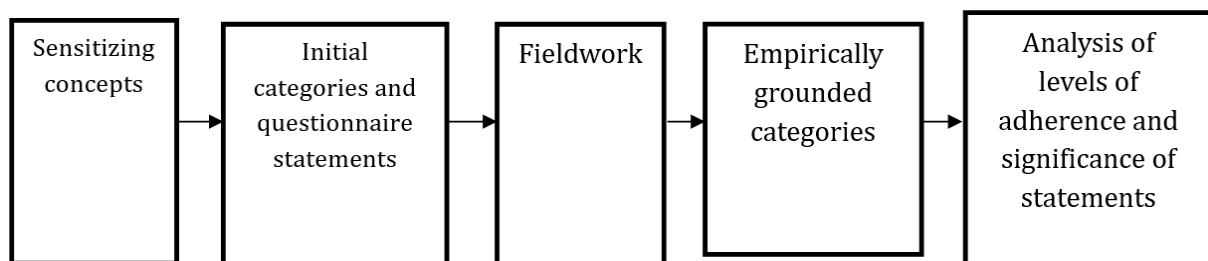The methodological steps in this Study are depicted in Figure 1.

Figure 1. Basic research steps in this study.

The exploration of sensitizing concepts lays the basis for initial categories and statements in the questionnaire used in the fieldwork. The results of the fieldwork are subsequently fed into a factor analysis in which the statements are regrouped into new categories, composed of statements that respondents tend to give the same (positive or negative) answer to and can therefore be regarded to represent empirically grounded categories ("underlying" or "latent" concepts, called "principal components" in the factor analysis). The statements and are then analyzed in terms of the levels of adherence they encounter with the respondents.

1.1. Conceptualizing Meaningful Life Through the Lenses of Shallow and Deep Happiness

Happiness according to positive psychology scholars relates to positive or pleasant emotions that spring out of contentment and joy [1-3]. In the *Nicomachean Ethics*, Aristotle sees happiness as the ultimate purpose of human existence [4, 5]. Aristotle also argued that humankind's relentless quest for pleasure, wealth and reputation can often be regarded as shallow, diverting people away from the deep happiness that comes with a meaningful life. Commenting on challenges associated with the persistent search for shallow happiness, Yacobi [6] noted that "the dilemma of the pursuit of happiness is that one can miss the meaningful moments in life since its quest does not lead to a permanent state or thing." This may explain why something that makes us extremely happy may soon lose its ability to do so. Wong and Fry [7] and Waterman [8] have also pointed out this observation.

I have chosen to write about shallow and deep happiness because these terms seem to speak to the everyday human experience. Shallow happiness is grounded in satisfying immediate human desires and appetites. Therefore, if we see happiness in a shallow sense, it means we have to relentlessly continue to seek new pleasures and experiences to "replenish" our happiness. With shallow happiness comes the urge to cast-off things that bring discontentment. This kind of pursuit, as Peterson and Seligman [9] observe, deprives us of the opportunity to learn from the unexpected and unpleasant moments in life and to reflect on our limitations.

In contrast to shallow happiness, deep happiness is connected to meaning and purpose in life. From a whole-life perspective, we can recognize that deep happiness is not necessarily being happy all the time. Leading a deeply happy life does not denote avoiding hard times, but "is about being able to respond to adversity in a way that allows

you to grow from the experience" [10]. The concept of meaning, according to positive psychologist Martin Seligman comes from belonging to and serving something beyond oneself ('Self-transcendence') and developing the best within oneself (The virtues). Seligman conceptualizes meaningful life as an element of happiness (2002, p. 61) and brings to the fore three kinds of happiness that humanity experiences: 1) pleasure and gratification, 2) exercise of strengths and virtues and 3) meaning and purpose. While he links each kind of happiness to positive emotions, there seems to be a continuum of happiness progressing from the strengths and virtues and ultimately to the happiness of meaningfulness and purpose that creates lasting fulfillment. This kind of lasting fulfillment is what Aristotle calls the 'good life' (*Eudaimonia*) and what Oster [11] likens to "looking beyond the surface of our world and finding the depth contained within".

From the foregoing exploration of shallow and deep happiness, there seems to be a consensus about what constitutes a meaningful life. Many authors attribute meaningful life to living a purposeful and self-transcendent life, serving something beyond oneself [1, 8]. In her book titled 'The Power of Meaning: Crafting a life that matters', Smith [3] delves into what constitutes a meaningful life and comes up with four important pillars that inform deep happiness, namely: belonging, purpose, transcendence and storytelling (Narration). She explains that

- Belonging entails being in relationships where one is valued for who one is intrinsically and where one values others as well.
- People have a purpose in their lives if they have something worth living for thereby propelling them into the future.
- Transcendence is the state of being beyond the constraints of the material world. Moments when people feel lifted above the hustle and bustle of daily life, their sense of self, fades away, and they feel connected to something bigger or higher reality.
- Narration entails making a narrative out of the events in one's life to provide clarity. Since we have the power to tell and to retell our life story in positive ways, this act of sharing personal experiences with others inspires them to make sense of themselves and their lives.

1.2. Theoretical Perspectives on Meaning

In this section, I discuss a general theoretical overview of the concept of meaning and meaningful life as expressed by some eminent scholars.

1.2.1. The Subjective Theory of Meaning

Proponents of subjective theories argue that the conditions for a meaningful life are inherently subjective, asserting that meaning arises when certain personal conditions are met, which involve individual awareness and experience. A key advocate of this perspective, Richard Taylor, sought to define what constitutes a meaningful life but found it challenging to provide a definitive answer [12]. Consequently, he turned to the concept of a meaningless life as a means to understand how meaning might be attained. Taylor references the ancient myth of Sisyphus, who was condemned to ceaselessly roll a giant stone up a hill, only for it to roll back down just before reaching the summit, forcing him to begin the task anew. From this narrative, Taylor notes that even if the task involved a smaller stone and a less steep hill, it would still be objectively meaningless. Meaning, in an objective sense, would only arise if Sisyphus's efforts produced tangible results or if he derived genuine satisfaction from his labor, seeing it as the only thing he wished to do. However, from a subjective standpoint, merely recognizing the inherent absurdity of the situation allows Sisyphus to transcend his fate. Thus, according to Taylor, an objectively meaningless life can be transformed into a subjectively meaningful one by embracing life's inherent struggles and challenges.

1.2.2. The Objective Theory of Meaning

Proponents of the objective theory of meaning postulate that one's life is meaningful if certain conditions are met, and those conditions should not require subjective awareness but should be objective [12]. One example is Frank Capra's view expressed in his film "It's a *wonderful world*" (1946) which identifies the meaningfulness of one's life in the objective good that one causes. The film presents one of the protagonists, a banker, George Bailey, who ponders committing suicide due to the collapsing family business. Amidst this negative contemplation, an angel discloses to him the positive contribution he had made in his community (Pottersville) and the lives he had touched. The angel shows this by revealing how Pottersville would have been had George not been born. His experience in the alternative Pottersville made him realize how meaningful his life had been and to reconsider his suicide attempt. From George's scenario, it appears that a meaningful life arises out of deeds with good effects and not necessarily out of the pursuit of fulfillment. This perspective agrees with Smuts [13] Good Cause Account theory which states that one's life is meaningful to the extent it effectively promotes the good. According to Smuts, "the good effects that count towards the meaning of one's life need not be intentional or even known".

1.2.3. Hybrid Theory of Meaning

The hybrid theory of meaning holds that a person's life is meaningful "if and only if a certain set of conditions is met, where those conditions include some objective conditions and some subjective conditions [13]". In her article titled, 'Meaning in Life and Why it Matters', Wolf [14] argues that people's quest for meaningful lives is independent of whether they enjoy their lives. To her, meaningful lives are those where people are actively engaged in worthwhile undertakings. She further makes an interesting observation that one may undertake projects that are meaningful but uninteresting. She also adds that it is quite possible to derive pleasure from undertaking certain projects that do not lead to a meaningful life. In this context, it appears that "meaning arises when subjective attraction meets objective attractiveness (*ibid, p. 233*). Wolf called this conception the bipartite view. She argued that the pursuit of a meaningful life enables people to find fulfillment as they connect to something beyond the self. However, finding fulfillment in what one engages in and the things one does must not only be those that one (subjectively) loves but also those that are objectively worthy of love. Thus, at the core of the hybrid theory, life is said to be meaningful if "it is subjectively fulfilled by pursuing objectively valuable ends" [13]. In the words of Van Den Born, et al. [15]: "a life that makes sense [subjectively] and a difference in the world [objectively]".

For the design of the questionnaire, I have adopted a hybrid point of view. Consequently, I felt free to include both objective and subjective elements in the wording of the questionnaire statements, depending on statement content.

1.3. Ubuntu in the Pursuit of a Meaningful Life

In this study, a meaningful life will comprise four pillars. Three of the pillars (belonging, purpose and transcendence) have already been discussed in Section 4.1. The fourth pillar that this study has adopted is Ubuntu philosophy. While Ubuntu seems to imbue aspects of belonging in general, it speaks more to how identity and moral growth are contiguous to the community and is firmly rooted in the African way of life [16, 17]. As Louw [18] explains, "Ubuntu can be interpreted as both a factual description and a rule of conduct or social ethics. It both describes the human being as 'being-with-others' and prescribes what 'being-with-others' should be about." As I will elucidate below, Ubuntu, is not only concerned about humaneness but also emphasizes a harmonious relationship between humanity and the natural environment.

Although the Ubuntu philosophy has been originally associated with the Zulu people of South Africa, many communities in Africa and beyond espouse it. According to the New World Encyclopedia, "Ubuntu implies an appreciation of traditional beliefs and a constant awareness that an individual's actions today are a reflection on the past, and will have far-reaching consequences for the future". The Ubuntu philosophy among the Baganda people of

Uganda may be translated as *Obuntubulamu* (Obuntu = Human character, bulamu = Health) pointing to a socially healthy way of being a human being.

In Ubuntu thought, humans do not survive or thrive as individuals [19]. They subsist or thrive as communities. Therefore, an individual grows to become human together with others and not alone [20]. Ubuntu seeks to uphold the "the duties and responsibilities the individual owes the community, the obligation of the individual to share what he has with the community" [21]. This is consistent with McMillan and Chavis [22] observation that "a strong community can fit people together so that people meet others' needs while they meet their own".

Ubuntu speaks to the African understanding of humanness where humanity is seen as being intimately connected with the elements of the ecosystem. This explanation is in line with Rayson, et al. [20] view of Ubuntu as "a critical theory for analyzing the human-nature relationship" under the following premises:

- Humaneness: entailing compassion and respect towards the community, humans and the environment
- Spirituality: a deep interrelation between humans and nature, sometimes mediated by religious beliefs and deities and sometimes with prophetic capacities attributed to elements in the environment
- In-depth knowledge of the land and its elements, its indigeneity, and changes over the years.

From Rayson's analysis, Ubuntu may be seen as a cultural common that speaks to values relevant for ecological sustainability. Therefore, "to become more fully human does not mean caring only for the self and other human beings [Community] but also the entire biophysical world" [23]. Ubuntu thus regulates individual actions and behaviour to yield collective responsibility, action, and solidarity towards ecological sustainability [24].

As a key element of Ubuntu, African spirituality continues to play a big role in the communication and transmission of local ecological culture. For instance, most Africans who have embraced Christianity and Islam (including the elite) continue to maintain their ties with the ancestral spiritual system for guidance. This was also observed by Mbiti [25] who referred to Africans as being "notoriously religious [spiritual]" as exemplified by the way African spirituality is interwoven in their way of life. Implicit in Mbiti's observation is that in most rural communities in Africa, spirituality cannot be detached from people's way of life and their relationship with nature. This is to say, "Humankind, according to the African thought and belief, is not an isolated creature. Humanity is only part of the universe which is full of animals, plants and inanimate objects" [26]. To put it simply, "human life is embedded in and related to ecological life" [23]. Therefore, Ubuntu worldview places humanity in constant communication and communion with nature and the universe.

1.4. Conceptualizing Local Ecological Culture

There is a growing body of literature explaining human adaptations to the social and physical environment. Human adaptations, in this case, are the basis upon which a population can survive and flourish. This, in essence, suggests that humans are part and parcel of their environment and not separate entities. Thus, both the environment and humanity affect and are affected by the other [27]. Many scholars have addressed this relationship drawing on the concept of 'ecological culture'. Bao [28] for instance, conceptualizes ecological culture in terms of material and spiritual values "necessary for a better living environment, in harmony with nature". In the present research, ecological culture has been understood in line with the definition propounded by Huong and Huong [29] as the "cultural space containing the relationships between people and nature".

The way of life (practices, values, and experiences) of local people and their communities is underpinned by ecological culture. Commenting on ecological wisdom, Xiang [30] points out that it embraces "both individual and collective knowledge" and is "received, preserved and transmitted orally in form of stories, proverbs, folklore, values, beliefs, rituals, community laws, the local language, and agricultural practices" [31, 32].

Traditional Ecological Knowledge (TEK) and its associated synonyms (indigenous knowledge, native knowledge and local ecological knowledge) have gained considerable attention in the environment and conservation

discourse Whyte [33]; Berkes [34]; Houde [35] and Stevenson [36]. Berkes, et al. [37] defined TEK as the generation, accumulation, and transmission of knowledge including the adaptive management of local ecological resources. Nakashima [38] hold a similar view of TEK as "knowledge and know-how accumulated across generations, and renewed by each new generation, which guides human societies in their innumerable interactions with their surrounding environment". Berkes [34] contends that "TEK is a cumulative body of knowledge and beliefs, handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment." [34].

In these TEK definitions, we note that "Knowledge" carries a strong overtone of what people know as opposed to what they value and do. If we wish to include values and practices in our scope, however, it would be much better to talk about Traditional Ecological Culture (TEC), in which TEK is only one part. TEC then refers to all elements of traditional culture that link up with people's actions towards the environment and this includes knowledge, beliefs, world views, values, connections, injunctions, practices, etc. TEC then is a broad concept but still connected only with traditional culture. But what is traditional? Many elements in a traditional culture can be relatively new and yet valid. Therefore, we define the concept of "Local Ecological Culture" (LEC) as all knowledge, beliefs, world views, values, connections, injunctions, practices, etc. that link up with people's actions towards the environment. Through this definition, LEC differs from "traditional" or "indigenous" culture or knowledge, in that LEC leaves the age and origin of values, meanings, and practices open. LEC emphasizes, however, that values, meanings, and practices be shared and connected to action (actually or with plausible potential), that is, they are not mere lip service to external powers, internal traditions, or perceived desires of the researcher ('social desirability'). Without a connection to real action, they are not local culture.

Local Ecological Culture puts into consideration the cultural perspectives that emerge as a result of external influences and acknowledges that culture is constantly changing as a result of interaction with members of other societal backgrounds. What emerges out of the cultural fusion is a hybrid culture. The boundaries of hybrid cultures as Clothier [39] observes, are "negotiated and can absorb diverse cultural influences". It is this negotiation of cultural influences that facilitates the integration of the past and present, local and trans-local practices leading to the emergence of local ecological culture [40].

1.5. Local Ecological Culture and Livelihood

"…People make the most of their beliefs, norms, customs, traditional knowledge, religion, spiritual elements and other creative sources to meet diverse livelihood objectives."[41].

Local people can withstand livelihood vulnerabilities using their shared skills, values, customs, and experiences. Thus, LEC is significantly associated with their everyday livelihood activities [41, 42]. Their values, meanings, customs, and knowledge systems affirm their cultural identity and diversity and play a key role in sustaining livelihoods [43, 44]. However, very little attention has been given to embedding local ecological culture in community livelihood approaches and sustainability initiatives. Appadurai [40] argues that culture should not be seen as a stumbling block for livelihood opportunities but should instead be viewed as a platform upon which livelihood approaches can "support local communities and in ways that are more meaningful to their daily lives (p. 24)." Local people have considerable knowledge of changes in seasonal patterns, what crop varieties do well in particular soils, varieties that are tolerant to droughts, pest-resistant varieties, natural pest control, and so on. For instance, 'in Kenya and mid-West Africa, farmers determine soil fertility, the height of water table, and soil profile by the presence of certain species of fern, earthworm casts, and certain herbaceous plants…. Farmers in the Tanzanian districts of Mbinga, Njombe, and Mbeya forecast the onset of rains by the cry of a certain bird, the chirping of crickets at night, the emergence of a particular type of weed, butterflies flying in droves from west to east, or an increased number of sparrows…In Nigeria when the kite population in the skies thins out, it signifies the onset of a rainy season' [45]".

Local forms of farming knowledge and practices help maintain biodiversity and enhance food security. In Mali, for instance, farmers attach Neem tree leaves to millet heads to discourage insect infestation [46]. By intercropping with cover crops, the speed of rainwater run-off is reduced thus controlling soil erosion. Intercropping with legumes enables fixing of atmospheric nitrogen in the soil due to a symbiotic relationship with bacteria found in their root nodules [47, 48]. When livestock is introduced into the farming system (mixed farming), the animals are fed on crop residues and weeds, and in turn, their waste is used as organic fertilizer to enrich the soil.

Generally, local farming methods provide insights that are central to sustainably managing soils, water, crops, animals and pests [49]. This information may provide a basis for developing agricultural technologies that are suited to local conditions. Indeed as Messer and Townsley [50] point out, culture reproduces itself, through reference frameworks packaged as knowledge, practices, and innovation systems, particularly those related to agriculture and food systems. In Uganda, the National Cultural Policy observes that culture as a crosscutting issue is not yet adequately reflected in other sectoral plans and policies. The policy further confirms that local ecological culture is the basis for problem-solving strategies among the rural poor. It is used in agriculture, local medicine, health care, food preparation, education, natural resource management and a host of other benefits. In the sections that will follow, I will discuss, based on data collected from the Mabira Forest area how LEC and livelihood are linked mainly through the ecological context and how this linkage relates to the quest for a meaningful life.

1.6. The Resulting Questionnaire and Research Questions

From the concepts discussed above, I developed a local ecological culture questionnaire (Table 1), also informed by Schwartz [51]; Seligman [52] and Norman and Kraft [53] on the more technical aspects. The questionnaire comprised of three themes, namely: (1) eudemonic values/deep happiness, (2) traditional ecological culture and (3) shallow happiness or the pursuit of livelihood. Deep happiness comprised of items related to transcendence, purpose, belonging and Ubuntu. The traditional e culture had statements derived from elements of traditional culture that traditionally link up with people's actions towards the environment. The third theme included statements that related to shallow happiness (concern for livelihood needs, production). This structure represents the "Initial categories" in the research steps overview of Figure 1.

Table 1. The local ecological culture (LEC) questionnaire.

Local ecological culture questionnaire for forest-adjacent communities (Includes Luganda translation)		
1. Meaningful life (Eudemonic values; Deep happiness)		
a) Belonging		
BELONG1	Humans, like other forms of life, cannot live without a healthy environment.	Obulamu bwaffe n'ebitonde ebirara bweyagaza olwokuba tukuumye obutonde bwensi
BELONG 2	We, like all other forms of life, are part of nature. We depend on one another for survival.	Nenyumiriza nnyo mu nkolagana eri wakati wange n'abantu ate n'obutonde bwensi
BELONG 3	Meaning in life comes from non-material things.	Obulamu obweyagaza tebuva mu bintu bikalu byokka
b)Transcendence		
TRANS1	Taking walks in the forest makes me feel better and enables me to meditate and reflect upon life.	Mpulira buluungi nga ntabuddeko mu kibira era ne kinsobozesa akulowooza n'okwefumintiriza ku bulamu.
TRANS2	Trees connect us to our ancestors and also to our past and future.	Emiti gituyunga ku bajjajjaffe, ku byaliwo ne ku binajja oba ku birijja.
TRANS3	The smell of the freshness of the forest relieves stress.	Akawoowo akava mu bibira katowoolokosa oba kkakkanya omuntu azitooweereddwa naddala mu birowoozo oba eyeelaliikiridde.
c) Purpose		
PURP1	The most important thing is to use our strengths to serve nature and humanity.	Ekisinga obukulu kwekukozesa amanyi gaffe okuwereza obutonde awamu n'abantu.
PURP2	The consequences of the resource use decisions we make affect future generations.	Ebiva mu ebyo byetusalawo ku ngeri gyetukozesamu eby'obutonde birina obuvune bwebituusa ku migigi egy'omumaaso.
PURP3	Future generations can solve their problems, and the problems we must tackle today are the ones we are currently experiencing.	Emigigi egijja gisobola okumalawo ebizibu byajo, ffe ebizibu byetulina okukola ko byebyo ebiriwo kati.
PURP4	When the children have grown, acquired employment, and can take care of themselves, then my purpose in life is fulfilled.	Singa abaana bakula ne bafuna eby'okukola era ne berabirira, olwo ekirubirirwa mu bulamu bwange mbera nkituukirizza.
d) Ubuntu		
UBUNTU1	Humans do not survive or thrive as individuals. They thrive as communities.	Abantu tebakulakulana bokka na bokka, bakulakulana ng'ekitundu.
UBUNTU2	My satisfaction is in living in harmony with nature [forest] and fellow community members.	Obumativu bwange buli mu kuwangalira mu mirembe n'obutonde (ebibira) era n'ab'omukitundu kyange bonna awamu.
UBUNTU3	Traditional customs, taboos and sacred rites provide a basis for defining acceptable resource use.	Eby'obuwangwa, emizizo, ennono n'enzikiriza bitema empeenda y'enkozesa y'eby'obuggaga eby'obutonde ebikirizibwa.
UBUNTU4	A strong community is able to fit people together so that people meet others' needs while they meet their own.	Ekitundu eky'amaanyi kisobola okusobozesa abantu okuwangalira awamu era abantu b'omukitundu basobozesa banabwe okwetusaako ebyetaago byabwe nga nabo bwebetusaako ebyabwe.
UBUNTU5	The communal responsibility towards ecological sustainability strengthens the way people relate with the forest	Obuvunaanyizibwa bwa bantu bonna mu kitundu eri okukuuma obutonde, kyongera amaanyi mu ngeri abantu n'ebibira gye bibeerana awamu

Local ecological culture questionnaire for forest-adjacent communities (Includes Luganda translation)		
		n'obulamu obwenjawulo. Kino kireetera abantu okussa ekitiibwa mu butone era ekivaamu be bantu n'obutonde okuyambagana.
2. Traditional ecological culture (TEC)		
TEC 1	Humans should not engage in activities that kill or destroy the habitat of other forms of life.	Abantu tebandyenyigidde mu bikolwa ebitta oba ebissanyaawo ebitonde webibeera oba obutonde obulala bwonna.
TEC 2	Humanity is intimately connected to the elements of the ecosystem (e.g. forests, rivers, lakes)	Embeera y'obuntu etambulira wamu nnyo dala ne mbeera y'obutonde(ng'ebibira,emigga,enyanja)
TEC 3	Our spiritual relationship with this forest [nature] is mediated by deities.	Ekimalawo okubuusabuusa ku nkolagana y'emyoyo gy'abantu n'obutonde g'amaanyi ga Katonda.
TEC 4	Our ancestral spirits are the invisible roots of this forest	Emyoyo gya bajjajjaffe, gye mirandira egitalabika egye kibira kino.
TEC5	We are trustees on the earth and should bestow on the next generation an environment as healthy as or healthier than the one we inherited.	Tuli bayima ku nsi era tuteekedwa okuteekerawo omujiji ogujja obutonde obulungi oba nga businga n'obwabajjajjaffe.
3. Livelihood (Production, shallow happiness)		
PROD1	Forest products supplement or complement inputs of fuel, food, medicinal plant products	Ebyo ebiva mu bibira/mu kibira byongera ku bungi bw'enku n'amanda, emmere ne eddagala eriva mu bimera.
PROD2	Food from the forests - like fruit, nuts, mushrooms, leaves, roots, insects and wild animals - often contributes a nutritious supplement to rural people and provides a safety net in times of hardship.	Emere eva mu bibira nga ebibala, obutiko, ebikoola, emirandira, ebiwuka n'ebisolo by'omunsiko bulijo biwa ab'omukyalo emere ejjuddde ebiriisa nadala mu budde obuzibu.
PROD3	I am concerned about my quality of life and health and do everything possible to enhance it.	Nfaayo eri omutindo gw'obulamu bwange era nkola kyona ekisoboka okusitula omutindo guno.
PROD4	I am happy when the harvest is good and the household has enough food to eat.	Nsanyukira amakungula amalungi era nga tulina emmere emala ab'omunju yange.
PROD5	Human welfare is more important than the welfare of other forms of life.	Obulungi bwo bulamu bw'abantu kikulu nnyo okusinga obwebintu ebirala byonna.
PROD6	Forests are very important where farm output and/or non-farm income declines.	Wadde abalimi bafuna mu kulima oba nga tebafunamu, ebibira bisigala bya nkizo.
PROD7	We humans can alter the shape of our world and our lives in it, and this power has made life better for most people.	Ffe abantu tusobola okukyusakyusa endabika ye ensi n'obulamu bwaffe mu yo, ate amaanyi gano gafudde obulamu bwa bantu abasinga okusukulumako.

1.6.1. Research Questions

Besides the main question of the structure and content of LEC, I was interested to know whether LEC would be differentiated along lines of age or sex. This could be valuable knowledge for practice. Because of its broad connection to philosophy, I also wanted to know what would be the outcome of the Meaningful Life category in the questionnaire separately. Therefore, the study was guided by the following research questions;

1. What are the main components of Local Ecological Culture in Mabira communities?
2. Is LEC differentiated along lines of age and sex?
3. What are people's ideas on meaningful life specifically?

1.7. Field Methods

The questionnaire items were rated on a 5-point Likert scale with responses ranging from -2 for "strongly disagree" to +2 for "strongly agree". With the assistance of two Luganda language teachers, the questionnaire was translated into Luganda (the most widely spoken local language) to cater for participants who had challenges comprehending the English language. An interviewer-administered questionnaire was largely preferred given the complexity of the subject of inquiry and this enabled probing to yield meaningful responses. Self-administered questionnaires were feasible for some literate members of the community.

The research was conducted in the same seven villages of the Najjembe Division as where the Study 3 study was conducted. Through the village Local Council chairpersons, a list of households in each village was obtained. A random sample of 20 households in each village was generated (in each village) using the Microsoft excel Rand () feature to come up with a random number for each household. Having randomized the list of households, a sample of twenty consecutive entries was selected to create a random sample of 20 participating households in every village. The questionnaire was administered to heads of households (husband or wife or unmarried head of the household) who were present at that time. In total, 140 participants took part in the study (61 females and 79 males).

1.8. Data Analysis

Questionnaire items were coded, the corresponding data entered into the SPSS software and analyzed using report generated case summaries, frequencies, Principal Components Analysis (PCA) and chi-square. Case summaries and frequencies helped to generate detailed descriptive information about the data by producing subgroup statistics for variables that existed within categories of one or more grouping variables. The data was tabulated using Microsoft excel and the levels of adherence, and the percentage number of respondents agreeing to particular questionnaire items were computed.

The PCA was used to create components that enabled us to interpret the dataset in a smaller number of components that could be meaningfully interpreted. In other words, the PCA takes a potentially large set of items and looks for a way that data can be reduced or summarized using a smaller set of components [54, 55].

The first step of the study was to verify whether the data set was suitable for analysis. Two tests were used to determine the suitability of the data, namely: Bartlett's measure of Sphericity and the Kaiser-Meyer-Oklin (KMO) measure of sampling adequacy (which should be more than 0.5 for a satisfactory PCA).

Principal Components Analysis was used to extract data using varimax. Attention was drawn to factor loadings of 0.5 and above. As illustrated in Figure 2, a scree plot was used to ascertain the number of components to extract for further analysis. As a rule of thumb, the line segment in the scree plot shows the fraction of total variance in the data as explained or represented by each principal component. Consequently, the focus was drawn to the elbow in the scree plot.

The elbow indicates the number of factors that should be generated by the analysis. In the scree plot, we have an elbow at the third component indicating that three components are the lowest number with a high level of explained variance.
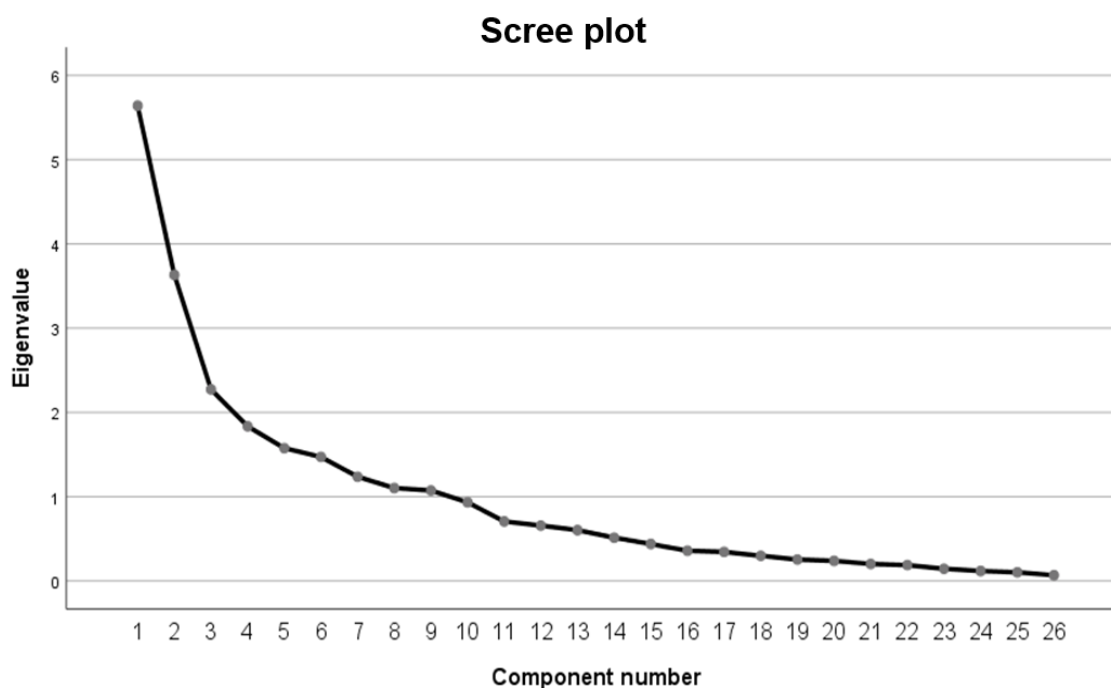

Figure 2. Scree plot.

1.9. Components and Levels of Adherence to Local Ecological Culture

Components of LEC were generated using PCA. In the first construct, 27 statements were loaded onto 9 components. With the KMO value of 0.693 and the significant (0.00) Bartlett's test of sphericity, the data was suitable for analysis. After data screening and in conformity with the scree plot, 14 statements were retained which loaded onto 3 components that explained 68.5% of the variance. Component 1 had 6 statements with high loadings, Component 2 had 5 while Component 3 had 3 statements. This is shown in Table 2. The table also shows the level of adherence or agreement expressed by the respondents on each of the items or statements, the mean adherence for each component and Cronbach's alpha. According to George and Mallery [56] the loadings should be 0.5 or greater to be considered practically significant while Cronbach's alpha values for each component extracted should be greater than 0.7. This level is reached by all three components, meaning that all three have enough coherence in the responses of the respondents.

Table 2. Components and levels of adherence to local ecological culture.

Component 1: Functional relationship with nature	Component loading	Level of adherence	Standard deviation
TEC5 we are trustees on the earth, and should bestow on the next generation an environment as healthy as or healthier than the one we inherited.	0.864	1.09	1.169
PROD2 food from the forests – like fruit, nuts, mushrooms, leaves, roots, insects and wild animals – often contributes a nutritious supplement to rural people and provides a safety net in times of hardship.	0.844	1.12	1.049
TRANS2 trees connect us to our ancestors and to our past and future.	0.833	0.82	1.431
PROD4 i am happy when the harvest is good and the household has enough food to eat.	0.693	1.69	0.658
PROD7 we humans can alter the shape of our world and our lives in it, and this power has made life better for most people.	0.642	1.10	0.887
UBUNTU5 the communal responsibility towards ecological sustainability strengthens the way people relate with the forest and other forms of life.	0.579	1.47	0.704

Component 1: Functional relationship with nature	Component loading	Level of adherence	Standard deviation
Mean level of adherence	-	**1.22**	-
Cronbach's alpha for component 1: (α) = 0.849			
Component 2: Environmental stewardship			
PURP1 The most important thing is to use our strengths to serve nature and humanity	0.888	1.01	1.119
UBUNTU3 traditional customs, taboos and sacred rites provide a basis for defining acceptable resource use.	0.724	0.84	1.446
PURP4 when the children have grown, acquired employment and can take care of themselves, then my purpose in life is fulfilled.	0.595	1.29	0.835
PURP2 the consequences of the resource use decisions we make have an effect on future generations.	0.533	1.23	1.134
BELONG2 we, like all other forms of life are part of nature. We depend on one another for survival.	0.572	0.93	1.256
Average level of Adherence	-	**1.02**	-
Cronbach's alpha for component 2: (α) = 0.806			
Component 3: Embedded life			
UBUNTU4 a strong community can fit people together so that people meet others' needs while they meet their own.	0.854	1.11	1.080
TEC3 our spiritual relationship with this forest [nature] is mediated by deities.	0.734	1.43	0.931
BELONG2 we, like all other forms of life are part of nature. We depend on one another for survival.	0.651	0.93	1.256
Average level of adherence	-	**1.16**	-
Cronbach's alpha for component 3: (α) =0.742			

In the -2 to +2 scoring system, 2 is the maximum attainable level of adherence to a statement which would occur if all respondents "fully agree" on that statement. In light of this, it can be noted that the mean level of agreement of all three components is quite positive, all lying above 1.0 ("agree").

The first component had the highest average level of adherence of 1.22 and the highest level of reliability with Cronbach's alpha = 0.85. The statements in this component are very diverse originating as they do from all three initial categories. But looking at them all, the idea of a functional relationship with nature seems dominant and some of them refer to ecosystem services. For instance, PROD2 and PROD4 are associated with food security; TEC5 and TRANS2 convey a conservation ethic that has a deep concern for future generations; PROD7 (we humans can alter the shape of our world and our lives in it, and this power has made life better for most people) expresses a degree of dominion or mastery over nature.

The second component had an average level of adherence of 1.02 indicating a positive attitude towards the statements but somewhat lower overall. The statements in this component seem to speak to environmental stewardship. From the statements, there is a sense of care (guardianship) for the environment as the linchpin for environmental protection (PURP1, PURP2, PURP4) and a nature-centered conservation ethic that is rooted in traditional customs and sacred rites (UBUNTU3). Nature-centredness is also reflected in the statement that emphasizes that humans are part of nature and cannot subsist without nature (BELONG2). In this respect, environmental stewardship seems to exemplify the idea of being part of nature and an affective commitment to protect the natural environment.

The statements in the third component seem to be associated with an embedded life. Embedded in this case means being part of something or being taken up (e.g. being embedded in a network of relationships or embedded in a community). The first statement is about social bonding or social dependence (UBUNTU4) and the third about human-nature dependence (BELONG2). The second statement is about the spiritual or religious relationship with nature, which can also be interpreted as being part of something bigger (TEC3).

1.10. Is LEC Differentiated Along Lines of Age and Sex?

In this section, the chi-square test of association was used to assess whether the local ecological culture of the people in the Mabira Forest area is differentiated along lines of age and sex. In order to somewhat reduce the data, the Likert responses of 'disagree' and 'strongly disagree' were merged as well as those of 'agree and 'strongly agree'. Together with the neutral responses, three groups were used in the analysis, namely: disagree, neutral and agree. The chi-square test was performed on the statements in the three LEC principal components generated in Section 4.9. The results of the chi-square test are presented in Table 4 and 5. The p-values reveal whether the findings in the study are statistically significant. A p-value less than or equal to 0.05 is considered to indicate a statistically significant differentiation.

1.10.1. LEC Differentiation According to Sex

Table 3 illustrates LEC differentiation according to sex. The results show the levels of significance of the various statements within each LEC component in relation to sex. In this section, I considered the levels of statistical significance of the men/women differently and then critically examined the direction of these differences.

Beginning with functional relation relationship with nature, it can be seen that TRANS2, UBUNTU5, PROD2, and PROD4 are highly significant with p-values less than the 0.05 threshold. This confirms that people's opinions related to trees as links to our past and future (TRANS2, $p = 0.004$), communal responsibility towards ecological sustainability (UBUNTU5, $p = 0.000$), availability of enough food for the household (PROD4, $p = 0.000$) and access to forest fruits and food (PROD2, $p = 0.001$) are differentiated according to sex.

On the other hand, two statements are not statistically significant. This concerns the view that we should bestow on the next generation an environment as healthy as or healthier than the one we inherited (TEC5, $p = 0.269$) as well as the view that humans have the power to alter the shape of the world to improve their lives (PROD 7, $p = 0.207$).

Table 3. LEC differentiation according to sex.

N=140	(M) Male: n=79						(F) Female: n=61						% Agrment for male&female	p-value
Functional relationship with nature	**D**	**%**	**N**	**%**	**A**	**%**	**D**	**%**	**N**	**%**	**A**	**%**		
TRANS2	24	30	12	15.2	43	54.4	10	16.4	7	11.5	44	72.1	62.1	0.004
UBUNTU5	5	6	2	2.5	72	91.1	0	0	0	0	61	100	95	0.000
TEC5	13	16.5	21	26.6	45	56.9	10	16.4	17	27.9	34	55.7	56.4	0.269
PROD2	11	13.9	15	19.0	53	67.1	1	1.6	18	29.5	42	68.9	67.9	0.001
PROD4	4	5.1	3	3.8	72	91.1	0	0	0	0	61	100	95	0.000
PROD7	6	7.6	10	12.6	46	58.2	6	9.8	10	16.4	45	73.8	65	0.207
Environmental stewardship														
BELONG 2	6	7.6	11	13.9	62	78.5	16	26.2	5	8.2	40	65.6	72.8	0.011
PURP1	0	0	4	5.1	75	94.9	20	32.8	22	36.1	19	31.1	67.1	0.000
PURP2	1	1.3	7	8.8	71	89.9	16	26.2	7	11.5	38	62.3	77.8	0.000
PURP4	4	5.1	3	3.8	72	91.1	3	4.9	10	16.4	48	78.6	85.7	0.048
UBUNTU3	13	16.4	10	12.7	56	70.9	20	32.8	10	16.4	31	50.8	62.1	0.006
Embedded life														
UBUNTU4	9	11.4	3	3.8	67	84.8	1	1.6	20	32.8	40	65.6	76.4	0.000
TEC 3	3	3.8	14	17.7	62	78.5	1	1.6	5	8.2	55	90.2	83.6	0.055
BELONG 2	6	7.6	11	13.9	62	78.5	16	26.2	5	8.2	40	65.6	72.9	0.011

Note: D = Disagree, N = Neutral, A = Agree.

For the second component (environmental stewardship), it can be seen that all statements have a statistically significant differentiation with p-values less than 0.05. In the third component (embedded life), one statement (TEC 3; our spiritual relationship with this forest [nature] is mediated by deities) had a p-value of 0.055, on the brink of being significant.

Looking at the direction of the significant differences, the following observations emerge:

In the "Functional relationship with nature" component, women have higher levels of positive response to three of the four significantly differentiated statements. This concerns the statements on happiness in a good harvest (PROD4), tree reverence (TRANS2) and communal responsibility (UBUNTU5). Men, on the other hand, have a more positive response to the food function of the forest (PROD2), while there is no significant difference on the other two statements. It is difficult to give a strong interpretation of this pattern, also because the component is hard to interpret as a single image, including as it also does, for instance, reverence for trees alongside happiness in a good harvest. Therefore, it only seems safe to conclude that neither one of the two sexes stands out as less functionally attached to nature.

In the "Environmental Stewardship" component, men have a higher level of agreement to all statistically differentiated statements, that is, on using our strength to serve nature and humanity (PURP1), the good function of traditional beliefs (UBUNTU3), children as the purpose of life (PURP4), the impact on future generations (PURP2) and the interdependence of humans and nature (BELONG2). Here, it seems safe to conclude that the men display a stronger awareness of the long-term good of sustainability.

In the "Embedded Life" component, women responded with stronger affirmation on the just-not-significant statement on mediation by deities (TEC3). On the two significant statements, however, the men had higher scores. This included embeddedness in the community (UBUNTU4) and the interdependence of humans and nature (BELONG2). Overall then, it seems safe to say that men tended to have a stronger emphasis on the embeddedness of life in community and nature.

1.10.2. LEC Differentiation According to Age

Three age brackets were considered for the analysis, namely: 18-39 years, 40-59 years and ≥60 years. Respondents in the 18-39 years category were 90, those in the 40-59 years bracket were 37 while those aged 60 years and above were 13. The results of the analysis are presented in Table 4. Again we will first look at which statements display a statistically significant differentiation, and then concentrate on the content of the significant ones. In the "Functional relationship with nature" component, the items TRANS2, TEC5, UBUNTU5 and PROD7 have p-values below 0.05. In the "Environmental stewardship" component, the same holds for the statements BELONG2, PURP1, PURP4 and UBUNTU3. In the "Embedded life" component, the age differences in UBUNTU4 and BELONG2 are statistically significant.

Table 4. LEC differentiation according to age.

N=140	18-39 years, n=90						40-59 years, n=37						Above 60 years, n=13						
Functional relationship with nature	D	%	Neutral	%	A	%	D	%	Neutral	%	A	%	D	%	Neutral	%	A	%	P-value
TRANS2	13	14.4	6	6.7	71	78.9	16	43.2	10	27	11	29.7	5	38.5	3	23.1	5	38.5	0.000
UBUNTU5	0	0	0	0	90	100	5	13.5	2	5.4	30	81.1	0	0	0	0	13	100	0.000
TEC5	8	8.9	29	32.2	53	58.9	11	29.7	6	16.2	20	54.1	4	30.8	3	23.1	6	46.2	0.020
PROD2	9	10	12	13.3	69	76.7	2	5.4	9	24.3	26	70.3	1	7.7	0	0	12	92.3	0.237
PROD4	1	1.1	1	1.1	88	97.8	3	8.1	2	5.4	32	86.5	0	0	0	0	13	100	0.097
PROD7	1	1.1	19	21.1	70	77.8	2	5.4	7	18.9	28	75.7	4	30.8	1	7.7	8	61.5	0.000
Environmental stewardship																			
Belong 2	20	22.2	14	15.6	56	62.2	1	2.7	0	0	36	97.3	1	7.7	2	15.4	10	76.9	0.002
PURP1	19	21.1	15	16.7	56	62.2	1	2.7	4	10.8	32	86.5	0	0	7	53.8	6	46.2	0.000
PURP2	15	16.7	12	13.3	63	70	2	5.4	2	5.4	33	89.2	0	0	0	0	13	100	0.140
PURP4	6	6.7	10	11.1	74	82.2	0	0	2	5.4	35	94.6	1	7.7	1	7.7	11	84.6	0.000
UBUNTU3	23	25.6	12	13.3	55	61.1	10	27.0	3	8.1	24	64.9	0	0	5	38.5	8	61.5	0.043
Embedded life																			
UBUNTU4	10	11.1	22	24.4	58	64.4	0	0	1	2.7	36	97.3	13	100	0	0	0	0	0.000
TEC 3	3	3.3	12	13.3	75	83.3	1	2.7	7	18.9	29	78.4	0	0	0	0	13	100	0.100
BELONG 2	20	22.2	14	15.6	56	62.2	1	2.7	0	0	36	97.3	1	7.7	2	15.4	10	76.9	0.002

With respect to the directions of these differences, the following can be said.

In the "Functional relationship with nature" component, the following differences in the significant statements were most salient in creating that significance:

- To the TRANS2 statement, saying that "Trees connect us to our ancestors and to our past and future", the young responded on a much higher level of affirmation than did the middle and old age groups.
- To the UBUNTU5 statement, saying that "The communal responsibility towards ecological sustainability strengthens the way people relate with the forest and other forms of life", both the young and the old respond with a 100 percent affirmation, while the middle group, though still positive, do so to a lesser extent.
- To the TEC5 statement, saying that "We are trustees on the earth, and should bestow on the next generation an environment as healthy as or healthier than the one we inherited", the young had a much higher level of agreement than the other age groups.
- On the PROD7 statement, saying that 'We humans can alter the shape of our world and our lives in it, and this power has made life better for most people", the significant difference arises because the older people are much less convinced of the merits of this idea.

Overall in this component, it appears that the young people tend to be even more ardent lovers of trees, community, earth and future generations than their older counterparts.

In the "Environmental stewardship" component, the significant differences were created mainly by that:

- To the BELONG2 statement, saying that "We, like all other forms of life, are part of nature. We depend on one another for survival", the middle age group agreed almost unanimously and higher than the young and old.
- To the PURP1 statement, saying that "The most important thing is to use our strengths to serve nature and humanity" was responded to in the same pattern.
- To the PURP4 statement, saying that "When the children have grown, acquired employment and can take care of themselves, then my purpose in life is fulfilled", the middle age group agreed more strongly than the old and young.
- On the UBUNTU3 statement, saying that "Traditional customs, taboos and sacred rites provide a basis for defining acceptable resource use", the 'agree' levels were roughly equal at more than 60% in all groups even though the young and Middle Ages had many more downright 'disagree' responses.

Obviously, the middle age groups are the champions of this component. This may have been partly built into the wordings of the PURP statements themselves, however. For a young person without children, for instance, it may be difficult to respond with 'agree' to a statement that starts with "When the children have grown…". Overall, therefore, we cannot say that young people were much less inclined to respond favorably to the statements.

The relatively high percentages of disagreement to the statements that emphasize traditional customs and taboos is important for environmental communication; emphasizing traditions may not appeal much to the non-elderly part of the population.

In the "Embedded Life" component, the significant differences were mainly as follows:

- To the UBUNTU4 statement, saying that "A strong community can fit people together so that people meet others' needs while they meet their own", the young responded with two-thirds agree, the middle group with almost unanimous agreement and the older group (amazingly) with unanimous disagreement.
- To the BELONG2 statement, saying that "We, like all other forms of life, are part of nature. We depend on one another for survival", the middle age group agreed almost unanimously and higher than the young and old.

This does not add to the conclusions already reached.

1.11. People's Ideas on Meaningful Life

This section focuses on the (initial) Meaningful Life subset of the LEC questionnaire statements. Because of its immediate connection to virtue ethics and positive psychology, it seemed of interest to provide this subset with its own analysis. In the questionnaire (presented in Section 4.6), meaningful life perspectives were underpinned by four elements, namely;

1. Belonging, understood as being in relationships where one is valued for who they are intrinsically and where one values others and the environment.

2. Transcendence: understood as moments when people feel lifted above the hustle and bustle of daily life.

3. Purpose: gives you something to live for and to move forward.

4. Ubuntu: pre-eminence of the interests of the community over the individual, and the responsibilities to care for community, nature and future generations.

A principal components analysis (PCA) was run analogous to the whole-questionnaire analysis of the preceding sections. This helped to find out the interrelationship between various meaningful life elements. In the first PCA round, 15 meaningful life items loaded onto 5 components. With the KMO value of 0.682 and the significant (0.00) Bartlett's test of sphericity, the data was considered suitable for analysis. After data screening, 11 items were retained that loaded onto 3 components. Component 1 had 6 items with high loadings, component 2 had 3 items, while component 3 had 2 items. This is shown in Table 5. The Table also shows the levels of adherence (agreement) expressed by the respondents on each of the items (statements), the mean adherence for each component and Cronbach's alpha measuring reliability of the data.

Table 5. Principal components for meaningful life.

Component 1	Meaningful life statements	Component loading	Level of adherence
	Stewardship		
UBUNTU3	Traditional customs, taboos and sacred rites provide a basis for defining acceptable resource use.	0.90	1.45
BELONG2	We, like all other forms of life are part of nature. We depend on one another for survival	0.76	1.26
PURP1	The most important thing is to use our strengths to serve nature and humanity.	0.65	1.12
PURP4	When the children have grown, acquired employment and can take care of themselves, then my purpose in life is fulfilled.	0.64	0.84
PURP2	The consequences of the resource use decisions we make have an effect on future generations.	0.59	1.13
UBUNTU5	The communal responsibility towards ecological sustainability strengthens the way people relate with the forest.	0.57	0.70
	Mean level of adherence	-	**1.08**
	Cronbach's alpha:0.80		
Component 2	**Ubuntu ecology**		
TRANS2	Trees connect us to our ancestors and also to our past and future.	0.74	1.43
UBUNTU1	Humans do not survive or thrive as individuals. They thrive as communities.	0.63	1.03
BELONG3	Meaning in life comes from non-material things.	0.63	1.26
	Mean level of adherence	-	**1.24**
	Cronbach's alpha: 0.51		
Component 3	**Communing with nature**		
UBUNTU2	My satisfaction is in living in harmony with nature [forest] and fellow community members.	0.76	1.23
TRANS1	Taking walks in the forest makes me feel better and enables me to meditate and reflect upon life.	0.64	0.97
	Mean level of adherence	-	**1.1**
	Cronbach's alpha: 0.32		

The results of the first component are highly reliable as shown by the Cronbach's alpha value of 0.80. Two items had a level of adherence below 1.0, i.e. scoring between 'neutral' and 'agree'. These items relate to the attainment of life's purpose when children can fend for themselves (PURP4, 0.84) as well as communal responsibility towards nature as the basis for the people-forest relationship (UBUNTU5, 0.70). The remaining statements had a level of adherence above 1.0 with the highest level of adherence of 1.45 being associated with traditional customs, taboos and sacred rites as the basis for defining acceptable resource use. In UBUNTU3 responsible environmental stewardship is rooted in spirituality; BELONG2 and PURP1 amplify a sense of care for the environment that is informed by people-nature interdependence; PURP2 is about concern for future generations as the basis for environmental conservation. UBUNTU5 is about communal responsibility towards the environment. PURP4 appears to suggest that a meaningful life is attained through conservation efforts directed towards meeting family obligations e.g. ensuring a future for children.

Looking at the statements in component 1, they overall seem to express meaningful life in the context of environmental stewardship. This implies that the meaningful life ideas that many locals have about Mabira Forest relate to responsible use and protection of the forest through conservation and sustainable practices.

Component 2 was moderately reliable with a Cronbach's alpha of 0.51 and comprised of three statements all with levels of adherence above 1("agree"). The statement with the lowest level of agreement (1.03) expresses the need for individuals to thrive as communities (UBUNTU1). The statement seems to exemplify the Ubuntu world view as the cornerstone for individual-community co-existence (community solidarity). The statement with the second-highest level of adherence (1.26) presented meaning in life as not being dependent on material things (BELONG3). In this case, the statement seems to imply that for some forest-dependent communities in Mabira area, a meaningful life entails valuing the forest for what it is, independent of the benefits people derive from it. The statement with the highest level of adherence (1.43) emphasized spirituality as the basis for resource use.

Arising out of Component 2 interpretation, it appears that a meaningful life is associated with Ubuntu ecology. While Ubuntu has largely been associated with an individual's responsibility towards the community, "the values that flow from it foster a better attitude towards the environment" [57]. The Ubuntu values of caring and sharing, together with the associated attitudes play a pivotal role in ensuring an ecological balance and co-existence between humanity and the environment. Chibvongodze [58] holds a similar view in his paper titled, 'Ubuntu is Not Only about the Human!' where he presents a case for consolidation of "the human [UBUNTU1], natural [BELONG3] and spiritual [TRANS2] tripartite" in Ubuntu.

Component 3 had the lowest reliability (0.32) and was comprised of two statements. Rather than to 'throw away' the whole factor due to low reliability, I analyzed each item in the factor separately. Moreover, the correlation matrix determinant was 0.23, indicating that the statements correlated fairly well. The first statement with a 1.23 level of adherence expressed satisfaction in living in harmony with nature (forest) and fellow community members (UBUTU2). The second statement with a level of adherence of 0.97 was about reflection and meditation while taking walks in the forest (TRANS1). Upon closer analysis, the two statements seem to suggest "communing with nature". This implies that there are many forest-adjacent people for whom communing with nature contributes to a meaningful life. In this state of communing with nature as Smith [3] points out, one is free from the constraints of the material world.

2. DISCUSSION AND CONCLUSION

The research in this study sought to identify what constitutes local ecological culture (LEC), people's ideas about a meaningful life, and whether LEC is differentiated along lines of age and sex.

2.1. Local Ecological Culture (LEC)

The principal components of local ecological culture were computed using Principal Components Analysis (PCA). As a data reduction technique, PCA made it possible to create a reduced set of statements that were easier to analyze and interpret. The analysis generated three LEC components. The statements in the first component were labelled as representing a functional relationship with nature; the statements in the second component appeared to be related to environmental stewardship while those in the third component were interpreted as representing an embedded life in which humans do not see themselves as separate from community and nature. It must be said, however, that the three components, even though significant in the statistical sense, remained difficult to interpret conceptually, combining as they do statements that originate from many categories from the initial categorization. In other words, we cannot be convinced yet that the ideas that generated the initial categorization, the statements that express these and their regrouping through the PCA are successful in representing local concepts. For the future, this is an invitation for further research that might work with other, more locally grounded statements, generated for instance in open interviews. For the present dissertation, we can avoid some of the difficulties by keeping attention on the separate statements, which do not carry that ambiguity.

To get the gist of the results in terms of separate statements, then, we can take a look at the highest-scoring ones in Table 2. For the interpretation of these levels of adherence, it is good to realize again that due to the -2 to +2 scoring between "strongly disagree" and "strongly agree", a mean score of +2 means that all respondents agreed to a statement and a score of +1 means that respondents agreed to the statement on average, hence still a quite positive response.

- With a level of adherence of 1.69, the highest-scoring statement PROD4 is a proclamation of pure and simple family happiness: I am happy when the harvest is good and we all have enough to eat. In a technical sense, this level of adherence can be seen as a sort of benchmark, a level reached by a statement that basically all people adhere strongly with. In terms of content, it may be noted that neither the community level nor nature or future generations are mentioned in the statement.
- The next-highest statement (level of adherence at 1.47), however, is UBUNTU5, which talks about communal responsibility towards sustainability and forest.
- The next-highest statement (level of adherence 1.43) is TEC3, stating that our spiritual relationship with this forest [nature] is mediated by deities.

On a level just below this, we find statement PURP2 that talks about the impacts on future generations, and even a relatively low-scoring statement such as BELONG2 (we are part of nature) still scores at a level of 0.93, implying that on average, the respondents agree to this.

On this basis, we can conclude that quite distinct from the theoretical difficulties of interpretation of the PCA results, there is a resonance of notions of relationship with nature and sustainability in the local people of the Mabira area. In other words, a strength-based and community-based approach toward conservation can build on a robust platform.

2.2. Meaningful Life

The analysis of the Meaningful Life subset of the LEC statements has been more theoretically oriented. On the subset, the PCA findings revealed three components, namely: environmental stewardship, Ubuntu ecology and communing with nature. The levels of adherence reveal that the majority of the respondents ascribed to the notion that a meaningful life is that where people are responsible stewards of the environment. In this case, as Chapin, et al. [59] point out, stewardship entails responsible use and protection of the environment through actions and practices that protect the environment through conservation and sustainable practices. The next attribution of a meaningful life was in respect of Ubuntu ecology which was underpinned by moral obligations not only to fellow human beings but also to the surrounding natural environment (cf. Chibvongodze [58]). The three questionnaire

statements that were attributed to Ubuntu ecology (trees connect us to our ancestors and also to our past and future; humans do not survive or thrive as individuals. but thrive as communities; meaning in life comes from non-material things) corroborated Chibvongodze's tripartite view on Ubuntu. This view epitomizes the consolidation of the human, natural and spiritual elements of Ubuntu. The third attribution of a meaningful life was linked to communing with nature which underscored intimate connection with the natural world at a transcendental level. This transcendental communion with nature, allows humans to use their senses to listen and to commune with nature.

2.3. Differentiation of LEC

To find out whether LEC was differentiated along lines of sex and age, a chi-square test of association was computed first, to identify individual statements within the three LEC components on which the differentiation over sex or age was statistically significant. In the overview below, I focus on these statements only, as was done in Section 4.10.

The standard image of differentiation of involvement in nature and sustainability is that women, being the traditional caretakers and more oriented towards the continuity of the family, have stronger inclinations towards community, nature, and sustainability. In terms of age, the young are often seen – also by the local people themselves, as the preceding study indicated – as more individualistic, unruly and self-centered, and more susceptible to go after the quick buck; the young should therefore score lower levels of agreement on questionnaire statements emphasizing community, traditions, sustainable management and respectful relations with nature.

Concerning unruliness and avoidance of traditions by relatively young people, something of this standard image appeared to be true. On the UBUNTU3 statement that focuses on traditional customs, taboos, and sacred rites, one-quarter of the young disagreed. Even here, however, the data shows that the middle-aged group had the same level of disagreement on this statement, while in the responses to the TRANS2 statement, saying that trees connect us to our ancestors and to our past and future, the young had a much higher level of agreement than the other age groups. Possibly then, the young tend to see the forest with a lesser degree of traditional respect but with greater reverence, akin to my feelings when I entered the forest for the first time, as elucidated on the first pages of this dissertation.

Also for the sex differentiation, the standard image showed up as drastically mistaken. In the 'Functional relationship with nature,' neither sex displayed more intense responses overall, and in the 'Stewardship' and 'Embedded life' components, the men were the champions of community and sustainability.

On the theoretical level, this invites rethinking and more empirically grounded re-research. On the practical level, this finding shows that a strength-based approach can build on the young and the old and on men and women equally.

REFERENCES

[1]   M. E. P. Seligman, *Authentic happiness: Using the new positive psychology to realize your potential for lasting fulfillment.* New York: Free Press, 2002.

[2]   M. Csikszentmihalyi and J. Nakamura, *Positive psychology: Where did it come from, where is it going? In K. M. Sheldon, T. B. Kashdan, & M. F. Steger (Eds.), Designing positive psychology.* New York: Oxford University Press, 2011.

[3]   E. E. Smith, *The power of meaning: Crafting a life that matters.* New York: Crown Publishing Group, 2017.

[4]   J. L. Ackrill, "Aristotle on eudaimonia," in *Proceedings of the British Academy, 1974, reprinted in Essays on Aristotle's Ethics, Ed. A. O. Rorty, Berkeley: University of California* 1980.

[5]   E. Brown, "Wishing for fortune, choosing activity: Aristotle on external goods and happiness," in *Proceedings of the Boston Area Colloquium in Ancient Philosophy,* 2005, vol. 21, pp. 57-81.

[6]   B. G. Yacobi, "Life and the pursuit of happiness," *Journal of Philosophy of Life,* vol. 5, no. 2, pp. 82-90, 2015.

[7]   P. T. P. Wong and P. Fry, *The human quest for meaning.* Mahwah: Erlbaum, 1998.

[8]   A. S. Waterman, "On the importance of distinguishing Hedonia and Eudaimonia when contemplating the hedonic treadmill," *The American Psychologist,* vol. 62, pp. 612–613, 2007.

[9]   C. Peterson and M. E. P. Seligman, *Character strengths and virtues: A handbook and classification.* Oxford: Oxford University Press, 2004.

[10]   L. Dowthwaite, "True happiness isn't about being happy all the time," Retrieved: https://theconversation.com/true-happiness-isnt-about-being-happy-all-the-time-88600. [Accessed 25th January 2019], 2018.

[11]   B. Oster, "Attaining a mindset of depth in a shallow world. MyLife Essay Contest 2017," Retrieved: https://www.meaningfullife.com/depth-shallow-world/. [Accessed 5th February 2019], 2017.

[12]   R. Taylor, *The meaning of life. In Exploring Philosophy: An Introductory Anthology: A Reader Klemke, E. &Cahn, S. (Eds),* 3rd ed. New York: Oxford University Press, 2009.

[13]   J. Danaher, "Hyperagency and the good life–Does extreme enhancement threaten meaning?," *Neuroethics,* vol. 7, no. 2, pp. 227-242, 2014. https://doi.org/10.1007/s12152-013-9200-1

[14]   S. Wolf, *Meaning in life and why it matters.* United Kingdom: Princeton University Press, 2012.

[15]   R. J. Van Den Born *et al.,* "The missing pillar: Eudemonic values in the justification of nature conservation," *Journal of Environmental Planning and Management,* vol. 61, no. 5-6, pp. 841-856, 2018. https://doi.org/10.1080/09640568.2017.1342612

[16]   M. Sheridan, "Environmental conservation through ubuntu and other emerging perspectives," *African Journal of Range & Forage Science,* vol. 32, no. 1, pp. 67-68, 2015. https://doi.org/10.2989/10220119.2014.944935

[17]   M. O. Eze, "What is African communitarianism? Against consensus as a regulative ideal," *South African Journal of Philosophy,* vol. 27, no. 4, pp. 386-399, 2008. https://doi.org/10.4314/sajpem.v27i4.31526

[18]   D. J. Louw, *The African concept of ubuntu and restorative justice. In: Sullivan, D. & Tifft, L. (Eds.), Handbook of restorative justice: A global perspective.* New York: Routledge, 2006.

[19]   O. Shumba, "Commons thinking, ecological intelligence and the ethical and moral framework of Ubuntu: An imperative for sustainable development," *Journal of Media and Communication Studies,* vol. 3, no. 3, pp. 80–83, 2011.

[20]   K. Rayson, S. Deborah, and P. S. Sachindev, *Culture and media.* Cambridge: Cambridge Scholars Publishing, 2014.

[21]   C. Musekura, *An assessment of contemporary models of forgiveness.* New York: American University Studies, Peter Lang, 2010.

[22]   D. W. McMillan and D. M. Chavis, "Sense of community: A definition and theory," *Journal of Community Psychology,* vol. 14, no. 1, pp. 6-23, 1986.   https://doi.org/10.1002/1520-6629(198601)14:1%3C6::aid-jcop2290140103%3E3.0.co;2-i

[23]   L. L. Grange, "Ubuntu/Botho as ecophilosophy and ecosophy," *Journal of Human Ecology,* vol. 49, no. 3, pp. 301-308, 2015. https://doi.org/10.1080/09709274.2015.11906849

[24]   C. A. Bowers, "Educational reforms that foster ecological intelligence," *Green Theory & Praxis: The Journal of Ecopedagogy,* vol. 5, no. 1, pp. 26-50, 2009.

[25]   J. S. Mbiti, *African religions and philosophy.* Nairobi: East African Educational Publishers, 1969.

[26] S. Gumo, S. O. Gisege, E. Raballah, and C. Ouma, "Communicating African spirituality through ecology: Challenges and prospects for the 21st century," *Religions*, vol. 3, no. 2, pp. 523-543, 2012. https://doi.org/10.3390/rel3020523

[27] C. O. Frake, "Cultural ecology," *American Anthropologist*, vol. 64, no. 1, pp. 53–59, 1962.

[28] T. Bao, *Ecological culture*. Hanoi: Vietnam Humanities, Culture and Information Publishing House, 2001.

[29] D. T. Huong and N. T. T. Huong, "Ecological culture and educational issue of ecological culture–motivation for the human development," *American Journal of Educational Research*, vol. 6, no. 6, pp. 694-702, 2018. https://doi.org/10.12691/education-6-6-17

[30] W.-N. Xiang, "Doing real and permanent good in landscape and urban planning: Ecological wisdom for urban sustainability," *Landscape and Urban Planning*, vol. 121, pp. 65-69, 2014. https://doi.org/10.1016/j.landurbplan.2013.09.008

[31] P. Nilayangode and V. Preetha, *Environmental challenges and Solutions, in: Laladhas, K.P., Nilayangode, P. &, Oommen, V.O. (Eds.), Biodiversity for Sustainable Development*. Cham, Switzerland: Springer International, 2017.

[32] M. Fitzmaurice, "The dilemma of traditionalknowledge:Indigenous peoples and traditionalknowledge," *International Community Law Review*, vol. 10, no. 3, pp. 256-257, 2008.

[33] K. P. Whyte, "On the role of traditional ecological knowledge as a collaborative concept: A philosophical study," *Ecological Processes*, vol. 2, pp. 1-12, 2013. https://doi.org/10.1186/2192-1709-2-7

[34] F. Berkes, *Traditional ecological knowledge in perspective. In Traditional Ecological Knowledge: Concepts and Cases, J. T. Inglis (ed.)*. Ottawa: International Program on Traditional Ecological Knowledge and International Development Research Centre, 1993.

[35] N. Houde, "The six faces of traditional ecological knowledge: Challenges and opportunities for Canadian co-management arrangements," *Ecology and Society*, vol. 12, no. 2, p. 34, 2007. https://doi.org/10.5751/es-02270-120234

[36] M. G. Stevenson, "Traditional knowledge and environmental management: From commodity to process," presented at the NAFA Conference "Celebrating Partnerships. September 14-18, 1998, 1998.

[37] F. Berkes, J. Colding, and C. Folke, "Rediscovery of traditional ecological knowledge as adaptive management," *Ecological Applications*, vol. 10, no. 5, pp. 1251-1262, 2000. https://doi.org/10.2307/2641280

[38] D. J. Nakashima, *Weathering uncertainty: Traditional knowledge for climate change assessment and adaptation*. UNU, Paris: UNESCO and Darwin, 2012.

[39] I. M. Clothier, *Created identities: Hybrid cultures and the internet*. London: Sage, 2005.

[40] A. Appadurai, *The production of locality. In Fardon, R. (Ed.), Counterworks: Managing the Diversity of Knowledge*. London: Routledge, 1995.

[41] C. D. Daskon, "Cultural traditions and Sustainable rural livelihoods: A case study from the Kandyan villages, central Sri Lanka," PhD Thesis, Department of Geography, University of Otago, New Zealand, 2010.

[42] J. Sjorslev, *Strengthening rural local institutional capacities for sustainable livelihoods and equitable development*. New York: Cornell International Institute for Food, Agriculture and Development (CIIFAD), 2006.

[43] C. Daskon and T. Binns, "Culture, tradition and sustainable rural livelihoods: exploring the culture–development interface in Kandy, Sri Lanka," *Community Development Journal*, vol. 45, no. 4, pp. 494-517, 2010. https://doi.org/10.1093/cdj/bsp019

[44] C. Holling, "Investing in research for sustainability," *Ecological Applications: A Publication of the Ecological Society of America*, vol. 3, no. 4, pp. 552-555, 1993.

[45] F. Nwonwu, "Using indigenous knowledge in traditional agricultural systems for poverty and hunger eradication: Reflections on prospects in South Africa," *Africa Insight*, vol. 37, no. 4, pp. 47-60, 2008.

[46] J. T. Inglis, *African indigenous knowledge and its relevance to sustainable development. In Traditional Ecological Knowledge: Cases and Concepts*. Ottawa, Ontario: IDRC, 1993.

[47] L. I. Smith, *A tutorial on principal components analysis*. Ithaca, NY, USA: Cornell University, 2002.

[48] C. A. Francis, *Multiple cropping systems*. New York: MacMillan, 1986.

[49] L. A. Thrupp, *Cultivating diversity: Agrobiodiversity and food security.* Washington, DC: World Resources Institute, 1998.

[50] N. Messer and P. Townsley, *Local institutions and livelihoods: Guidelines for analysis.* Rome: Rural Development Division of the FAO, 2003.

[51] S. H. Schwartz, *Universals in the content and structure of values: theoretical advances and empirical tests in 20 countries. In: M. Zanna (Ed.), Advances in Experimental Social Psychology.* New York: Academic Press, 1992.

[52] M. E. P. Seligman, *Flourish: A visionary new understanding of happiness and well-being.* New York: Free Press, 2011.

[53] J. V. Norman and M. E. Kraft, *Environmental values-how do you rate yourself? Environmental policy,* 4th ed. Washington: CQ Press, 2000.

[54] L. I. Smith, "A tutorial on principal components analysis," 2002.

[55] D. Lee, W. Lee, Y. Lee, and Y. Pawitan, "Super-sparse principal component analyses for high-throughput genomic data," *BMC Bioinformatics,* vol. 11, pp. 1-10, 2010. https://doi.org/10.1186/1471-2105-11-296

[56] D. George and P. Mallery, *SPSS for Windows step by step: A simple guide and reference. 11.0 update,* 4th ed. Boston: Allyn & Bacon, 2003.

[57] E. Etieyibo, *Ubuntu and the environment. In: Afolayan A., & Falola T. (Eds.), The Palgrave Handbook of African Philosophy* New York: Palgrave Macmillan, 2017.

[58] D. T. Chibvongodze, "Ubuntu is not only about the human! An analysis of the role of African philosophy and ethics in environment management," *Journal of Human Ecology,* vol. 53, no. 2, pp. 157-166, 2016. https://doi.org/10.1080/09709274.2016.11906968

[59] F. Chapin, S. Kofinas, P. Gary, and C. Folke, *Principles of ecosystem stewardship: Resilience-based natural resource management in a changing world.* Berlin: Springer, 2009.